ERICSSON

Solution brief

Connected machines, people and data. A smarter factory.

How 5G is bringing data-driven manufacturing to life

Transform or risk becoming obsolete

The digitalization journey is well underway in the manufacturing industry and the impact is undeniable. According to a survey by software provider Aptean, 44% of manufacturers in advanced stages of digitalization report being "prospering," compared to just 28% in the early stages. The ROI of these efforts speaks for itself.

However, digital transformation is no quick fix. It's a "journey" with its own complexities, costs and challenges along the way. To unlock a data-driven future, manufacturers must prioritize investments that drive measurable impact, boost efficiciency, and ensure scalability for both the current and future landscape.

Top technology trends transforming the manufacturing sector

As digitalization gains traction and new technologies emerge, manufacturers are focusing on strategic technology initiatives to stay ahead of the curve.

Transitioning to smart manufacturing

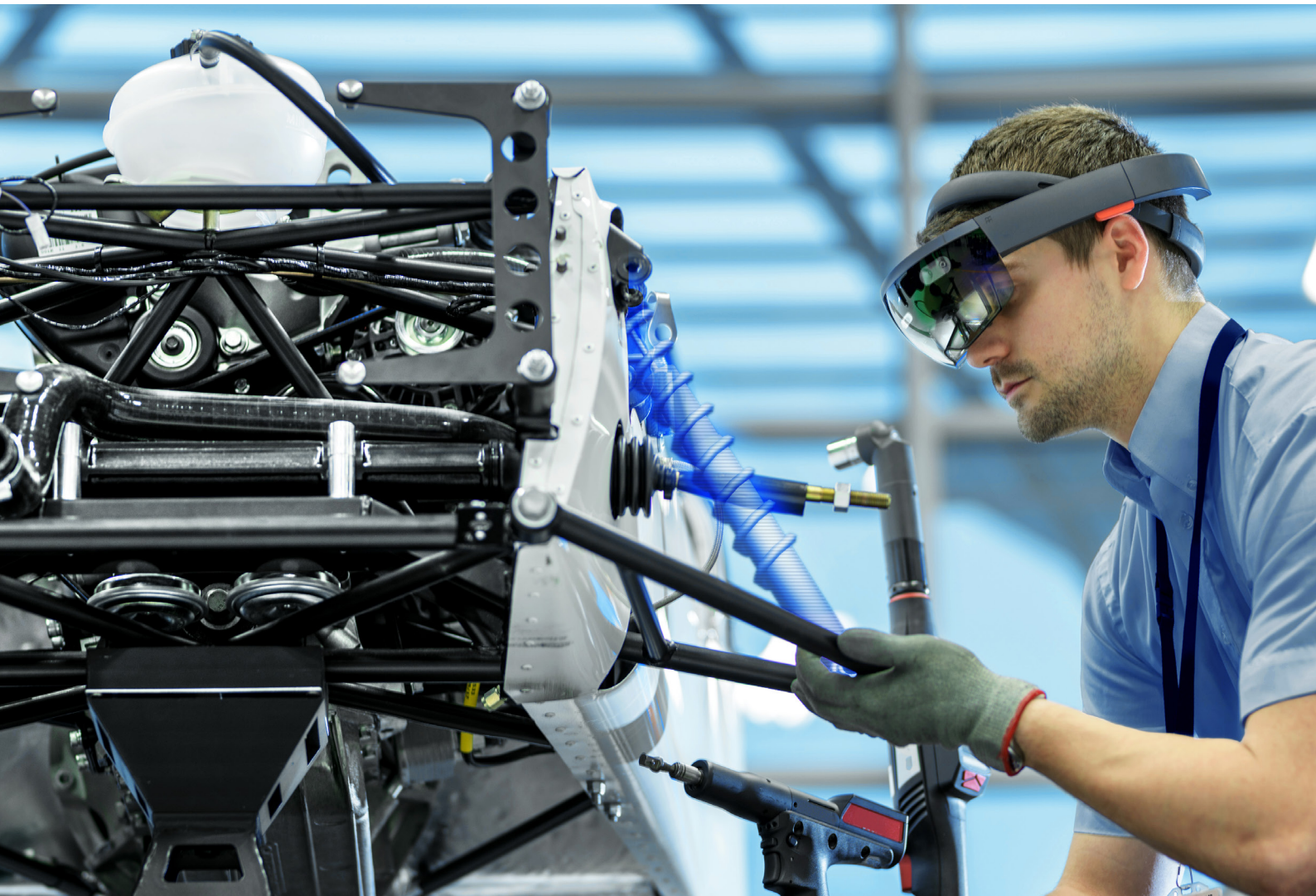
Unlocking the potential of a data-driven factory requires implementing advanced technologies that enable data driven workplace safety, productivity and product quality. Once in place, these innovations pave the way for more efficient, resilient, and cost-effective operations. However, a solid foundation is key. Manufacturers need a clear roadmap to transition smoothly to foundational tools, such as sensors and online workflows, that enable advanced technologies like digital twins, cognitive computing, extended reality (XR) experiences and hyperautomation.

Evolving IT and physical assets

Along those same lines, a manufacturer's digital transformation roadmap must look beyond immediate needs and plan for infrastructure demands years into the future. Digitalization is a continuous journey, where today's cutting-edge tools become tomorrow's baseline. IT systems, such as ERP, manufacturing execution system (MES), product life cycle management (PLM), and revenue growth management, must evolve alongside physical asset management to support long-term success.

Driving IT efficiency

Ultimately, improving efficiency and reducing costs are critical to enabling transformation. Manufacturers are integrating emerging technologies like artificial intelligence (AI), machine learning and cloud computing to modernize their IT ecosystems while optimizing expenses. The goal? A seamlessly integrated IT and OT framework that optimizes asset lifecycles, eliminates inefficiencies and maximizes operational performance.



Key technology investments powering manufacturing's digital future

As digitalization redefines manufacturing, CTOs and CIO are prioritizing technology investments that lay the foundation for scalable transformation and deliver measurable outcomes. There's a lot at stake in this highly competitive landscape, and three key areas of investment stand out:

- **Autonomous things accelerate hyperautomation:** From autonomous mobile robots (AMRs) and drones to intelligent robotics, autonomous systems are redefining efficiency. These innovations rely on real-time data and secure, high-speed connectivity to operate seamlessly in a truly integrated manner.
- **Industrial IoT enables process optimization:** Industrial IoT (IIoT) ecosystems form the backbone of modern data-driven manufacturing. It enables IT/OT integration and interoperability across distributed infrastructure, ensuring smooth data flow to optimize operations and modernize systems.
- **Advanced analytics drive smarter decisions:** IIoT-generated data becomes actionable with advanced analytics powered by an increasing variety of specialized AI and machine learning. Real-time insights allow manufacturers to enhance operations, streamline workflows, and improve decision-making.

Making the transition to a data-driven smart factory

Together, technologies like autonomous things, Industrial IoT, and advanced analytics create a truly, data-driven smart factory that streamlines production processes and unlocks new areas for improvement.

The key to everything:

Data.

Data from digitalized processes offers deeper insights while enhancing operational predictability into operations. By leveraging this data, manufacturers can manage downtime more efficiently, ensure precise quality control, accurately monitor inventory, and proactively address potential issues without disrupting operations. And as sustainability increasingly becomes top-of-mind across supply chains, manufacturers are also adopting advanced analytics and automation to optimize where energy is sourced and how it is used to improve efficiency and minimize waste.

Embracing new technologies paves the way for innovative operating models and revenue streams. Consequently, manufacturers must be agile as they introduce new products and services to align with evolving customer demands. Digitalization brings flexibility to the factory floor, empowering manufacturers to create new products or services at speed, while AI-driven insights enable them to not only meet market needs but also anticipate them.

Unlocking the full potential of smart factories with a unified connectivity platform

Transforming manufacturing through data begins with a unified connectivity platform—one that seamlessly integrates existing digital assets while enabling the adoption of new technologies. At the heart of this transformation is 5G connectivity, delivering scalable, flexible solutions that harnesses massive amounts of data generated by IIoT devices.

In fast-moving, dynamic manufacturing environments, 5G platforms offer the reliable, secure performance needed for data-intensive use cases. Unlike traditional networks, 5G offers unparalleled benefits:

- **Superior, seamless coverage** to facilitate connectivity for machines and workers alike, both indoors and outdoors
- **Built-in mobility** for seamless performance as devices move within the network
- **Ultra-low and predictable latency** for robotics and autonomous vehicles, minimizing signal delay between devices
- **Enhanced security** to protect secure data transfer through dedicated frequencies and end-to-end encryption
- **Speed and flexibility** to deliver rapid real-time data transmission, facilitating informed decision-making processes
- **Expanded device connectivity** for a broader array of machines and sensors, vital for seamless digital transformation
- **Better governance** for permitted devices on the network, ensuring meticulous control
- **Cost-efficiency** with a factor of 10 fewer communication nodes, compared to Wi-Fi for the same area

Ericsson solutions, including private 5G networks, facilitate top-of-mind priorities to propel factories into the Industry 4.0 era. The high-speed, enhanced security and low-latency of 5G makes it the key enabler of digital transformation—addressing the needs of today as well as what's required for tomorrow.

"Pairing private 5G with cloud technology not only enables vast scalability but also strengthens cybersecurity, dramatically simplifying the network complexities often encountered with other wired and wireless solutions"

Sudhanshu Gaur
Vice President of R&D, Hitachi America and
Chief Architect, Hitachi Astemo Americas

Learn more

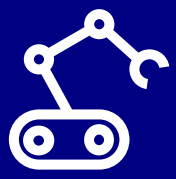
"It is in Calpak's DNA to continuously evolve and improve its production processes and products. This is why—in partnership with Ericsson, COSMOTE and Gizelis Robotics—we are eagerly investing in joining the 4th industrial revolution. With pride and passion, we are transforming our plant into the first smart factory in Greece using a cellular campus network, hoping to motivate other Greek companies to join us on this path. This important step is part of our ongoing effort to add value to our products to the benefit of our customers and increase our competitiveness in Greece and abroad."

Kostis Konstantinidis
Calpak CEO

Learn more

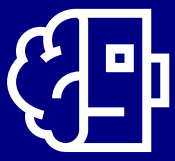
Enabling three major use cases with 5G

5G is helping manufacturers maximize their investments in autonomous things, Industrial IoT and advanced analytics.



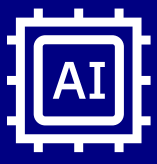
Autonomous things

5G's faster data speeds, higher bandwidth, and ultra-low latency enable seamless communication paths for AMRs, robots, drones and more. 5G serves as a unified solution for managing autonomous devices throughout a facility—allowing IT teams to deploy, monitor, and troubleshoot devices regardless of location and without capacity limitations. And with edge computing, 5G allows real-time processing of high-definition data, enabling autonomous devices to operate and make decisions with no delay.



Industrial Internet of Things

5G offers the reliable, low-latency connectivity that IIoT devices require for smooth operation in factory settings. Unlike Wi-Fi, 5G avoids interference and offers greater range, ensuring consistent, high-quality connections. It also keeps sensitive data on-site, bolstering security by reducing the vulnerability of transmitting data over larger distances.



Advanced analytics

AI and machine learning will propel smart factories to the next level, but they will require advanced connectivity that are only possible through a 5G network. These tools need a robust infrastructure with proximity to public clouds, access to ecosystem partners and global scalability. 5G networks are built to handle the large volume of data generated by IIoT devices, ensuring seamless data capture and efficient, real-time processing.

How Ericsson's solutions power the smart factory journey

Achieving smart manufacturing goals requires seamless interoperability across a robust connectivity platform. Ericsson's tailored solutions empower manufacturers at every stage of their digitalization journey.

Ericsson Private 5G

Ericsson Private 5G provides high speed, secure 4G and 5G connectivity, designed for industrial use to accelerate factory transformation. This easy-to-deploy, manageable, and scalable private network supports a wide range of industrial applications, both indoor and outdoor. Key features include:

- An award-winning radio portfolio supporting global industry standards and licensed spectrum
- A cloud-based network management portal and a troubleshooting app built to meet users' needs while keeping data secure
- Options for 24/7 support of managed operations and SLAs.

With its open API, Ericsson Private 5G integrates easily with IT and OT systems. Designed to scale alongside business growth, the solution offers a range of deployment options to match manufacturers' unique situations, allowing them to start small and scale as the business grows—providing a seamless path to Industry 4.0.

Ericsson Enterprise 5G Coverage[1]

As outdated distributed antenna systems (DAS) need to be replaced, high-performing neutral host networks are essential for enterprise spaces that require strong coverage, serious capacity, and need to serve people with different service providers. Ericsson's Enterprise 5G Coverage solution extends seamless 4G and 5G service from major network operators into and around manufacturers' facilities, enabling Enhanced 911 services and connectivity for visitors or employees to improve connectivity experience and drive operational efficiency.

Powered by the carrier-approved Ericsson Radio Dot System and Micro Radios, the system delivers a high-performing, scalable, cost-efficient dual mode 4G/5G solution, built and optimized for indoor deployments. The Radio Dot System provides superior performance at a fraction of the cost, offering 10x the capacity and half the total cost of ownership, compared to legacy DAS.

With support for multiple frequency bands and certification from all three major US operators in a single Dot, it's an ideal choice for streamlined, efficient, and future-ready connectivity.

The same Radio Dot System can also power private cellular networks, providing enterprises with a sustainable, cost-effective, and future-proof connectivity platform that drives innovation and positions them ahead of their competition.

How can we support your manufacturing journey?

As a high-tech manufacturer ourselves, Ericsson brings a unique perspective to the challenges and opportunities in manufacturing. Across our factories in the US, Europe and Asia, we've successfully implemented 5G technologies and Industry 4.0 practices. By integrating intelligent automation and real time data insights, we continuously optimize operations and drive innovation—experiences that position us to guide other manufacturers on their digital transformation journeys.

[1] Only available in the United States

Ericsson is at the forefront of creating game-changing solutions that define the future of manufacturing.

Recognized as a leader in cellular network technologies with over 60,000 granted patents and numerous accolades, Ericsson is at the forefront of creating game-changing solutions that define the future of manufacturing. By combining innovation, expertise and cutting-edge technology, we enable new possibilities in manufacturing communication and operations.

Smart factories are no longer a future consideration for manufacturers—they're the present reality. Transformative applications, like full automation, rely on high-quality, continuous data and real-time responsiveness. To stay competitive and prepare for the future, manufacturers must implement the right infrastructure to meet the evolving demands of Industry 4.0—and Ericsson's 5G cellular networks are the foundation for this transformation.

Discover how Ericsson's smart manufacturing solutions can support your digitalization journey.

Visit our website: **www.ericsson.com/manufacturing**

About Ericsson

Ericsson enables communications service providers and enterprises to capture the full value of connectivity. The company's portfolio spans the following business areas: Networks, Cloud Software and Services, Enterprise Wireless Solutions, Global Communications Platform, and Technologies and New Businesses. It is designed to help our customers go digital, increase efficiency and find new revenue streams. Ericsson's innovation investments have delivered the benefits of mobility and mobile broadband to billions of people globally. Ericsson stock is listed on Nasdaq Stockholm and on Nasdaq New York.

www.ericsson.com/manufacturing